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ABSTRACT

Seven articles report on the effectiveness of suggestive instructional methods in improving learning in various academic subjects. The following reports are included: (1) "Americanizing Suggestopaedia: A Preliminary Trial in a U.S. Classroom," by Charles E. Gritton and Ray Benitez-Bordon (deals with science instruction at the eighth grade level): (2) "Educational Experiment: Therapeutic Pedagogy," by Cecelia Pollack (a brief position paper): (3) "Relaxation and Suggestion in a Recognition Task," by Julian L. Biggers and Mathias E. Stricherz: (4) "Adapting the Lozanov Method for Remedial Reading Instruction:" by Allyn Prichard and Jean Taylor: (5) "The Effects of the Alpha Mental State, Indirect Suggestion, and Associative Mental Activity on Learning Rare English Words," by Donald H. Schuster: (6) "The Effects of Imaging Ability, Prepared Images and Sex of Subject on Learning English Words," by Schuster, Mark Stavish, and Margaret Burchinal; and (7) "Suggestive-Accelerative Learning and Teaching: An Experiment with Elements of an Altered States Approach in Reading," by Dean Held. (JB)

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THE JOURNAL OF SUGGESTIVE-ACCELERATIVE LEARNING AND TEACHING

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Ray Benitez-Bordon
Editor

Donald H. Schuster
Associate Editor

Twyla J. Gettert
Assistant to Editor-Subscriptions

Samuel Ginn
Circulation

CONTRIBUTING EDITORS

Allyn Prichard, Ed.D.
Director of Student Development
Reinhart College

Donald H. Schuster, Ph.D.
Professor of Psychology
Iowa State University

Dean Held, Ph.D.
Department of Educational
Psychology, Teacher Education.
University of Wisconsin-Superior

Leonard A. Miller, Ph.D.
Past President, ARCA
Counselor Education Division
University of Iowa

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Director of Educational Research
Texas Tech University

W. Jane Bancroft, Ph.D.
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College, University of Toronto.

Gabriel L. Racle
Suggestopedia Program
Public Service Commission
Ottawa, Canada

Peter Kline
Special Project, Sandy Springs
Friends School
Sandy Springs, Maryland.

Jean Taylor
DeKalk Co. Schools
DeKalb, Georgia

Marilyn Ferguson
Brian/Mind Bulletin
Los Angeles, California

Jerry Allen, Ph.D.
Silva Mind Control
Laredo, Texas

Cecelia Pollack, Ph.D.
Lehman College
New York, New York

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Americanizing Suggestopedia: A preliminary trial of a U.S. classroom.

Charles E. Gritton
Wilson Jr. High School
Des Moines, Iowa

and

Ray Benitez-Bordon
Iowa State University

Abstract

An Americanized version of Suggestopedia called Suggestive-Accelerative Learning and Teaching (SALT) was used to teach eighth grade science in a public junior high school. Similar students in two other local schools provided comparison data. The method used waking suggestions and unusual presentation styles to accerate learning. Pretest scores showed the experimental students to be significantly behind the control students at the start of the school year. There were no significant differences between experimental and control students on raw posttest scores at the end of one semester. However when adjusted for pretest differences, the experimental students had significantly higher posttest scores. Since the SALT method was used only 1/5th of the time in the classroom, the method appears to have considerable potential to improve classroom learning.

Introduction

The appearance of Suggestopedia on the American scene has caused a flurry of interest among teachers, teachers-to-be, and researchers in the United States and other Western countries. Suggestopedia is a system of instruction developed by Georgii Lozanov, Suggestology Research Institute, Sofia, Bulgaria. It has been publicized and mystified as "the answer" to the educational problems now facing our troubled system of education. With claims made and statements found in the Bulgarian technical literature supported by research, we asked: "Will it work in the United States? Will it work in the classroom under conditions normally encountered in our educational institutions?"

Suggestopedia needs a brief definition. It uses waking state suggestions and unusual presentation styles to accelerate classroom learning. In essence, relaxation, concentration, and suggestive principles are weaved together into a methodology that strengthens the student's ego and expands his/her learning capabilities; relaxing classical music is also used with the material to be learned.

Most of Lozanov's work had been done with foreign languages (Lozanov, 1971). The bulk of the reported research from Bulgaria and the United States has been done in the teaching of foreign languages to a wide variety of students at different stages of development. Little, if anything at all, seems to have been done with other subject-matter. There are exceptions; although most experimental work carried out in this country centered around replications of Lozanov's foreign language procedures

and results, two other important studies should be mentioned. Prichard and Taylor (1976a; 1976b) have carried out two experiments on the application of a Lozanov based experimental teaching treatment aimed to improve reading levels of reading disabled elementary school pupils. Both studies reported significant results favoring the experimental, Lozanov based, teaching treatment. Held (1976) reported some support for the effectiveness of suggestopedic concepts in the teaching of word meanings to a cross-section of an elementary school pupil population at the University of Wisconsin-Superior. The research done with foreign languages has been reported elsewhere (Benitez-Bordon, and Schuster, 1976; Schuster, 1976).

But does it work? Can it work with other subject-matter? With age groups other than college students? On a non-laboratory basis? What kind of teacher can pull off a successful application of Suggestopedia in an American classroom? Can it work in Des Moines, or Kansas City, or Phoenix, or Atlanta, or . . .?

We decided to start in Des Moines. The purpose of the study was to explore the dynamics of applying an Americanized version of Suggestopedia in the classroom. This version was called Suggestive-Accelerative Learning and Teaching (SALT) and has been discussed elsewhere (Schuster, Benitez-Bordon, and Gritton, 1976). What adaptations will be necessary to adjust the system of instruction to the reality of the classroom and the school? Is it possible to adapt SALT/Suggestopedia's general principles and not dilute their effects on achievement? these, and many other important, questions were asked in the privacy of our consciousness.

We knew that Lozanov had begun a program of applied research through his Institute in cooperation with the Ministry of Education in Bulgaria (see Pollack, 1976). Reports of applications of Suggestopedia appeared in the Institute's technical journal, ***Suggestopedia and Suggestology***. However, for incoming foreign data to acquire some meaning, we needed to follow a series of steps leading from exploration and research to applications in systematic field studies. These steps were as follows. First, we felt the need to work out the essence of the Lozanov system in our own minds; taking this initial step meant both the acquisition of an understanding of the methodology and the spirit of the system, and its demystification.

The second step was to test empirically the effects of protocols developed out of the understanding. In this process of protocol development, we relied heavily on work reported in the Bulgarian and Canadian educational literature (especially usefull were Bancroft's 1976 article and Lozanov's 1971 book). The next step was to test the effect of the protocols in pilot studies involving foreign language teaching (Benitez-Bordon and Schuster, 1976a; Schuster, 1976). A corollary of the empirical testing process was to develop a program of basic research in the methodology of suggestion by utilizing Lozanov's constructs (see

Benitez-Bordon and Schuster, 1976b). Finally, we were then ready to begin a pilot study of the application of Americanized Suggestopedia (or SALT) in the classroom.

In order to proceed with the application in a classroom situation, the need arose to train teachers in the use of the system. A week long workshop was set up in the summer of 1975 to prepare teachers in the use of the protocols and to familiarize them with the theoretical constructs developed by Lozanov. The senior author was a participant in the workshop carried out at Wilson Junior High School, and had agreed to test the instructional system in his classroom for the first semester of the 1975-76 school period. The study reported here is the result of his application in the classroom as compared to two control schools.

Problems of a classroom application

In our readiness to begin an empirical test of SALT in an actual classroom situation under normal conditions, we encountered a set of problems described below.

The first set was concerned with methodology and the opportunity for its use in the classroom. How much of what we had learned from past research could be useful and applicable in a junior high school classroom? We had worked with college and upper high school students in the research with foreign languages. How will adaptation be made to fit the demand characteristics of the classroom situation. Just how much of the time will be involved in the actual use of SALT procedures in classroom work? Will the sequence developed for the teaching of foreign languages be equally useful and effective with junior high school students? How will a relaxed psychological atmosphere be put in operation in the classroom? Were the test forms to be used sufficiently face- and content-valid to show measures of gain or loss?

The second set of difficulties faced in the course of this study pertained to the school milieu. The study had to be carried in an atmosphere created by a "don't rock the boat" school attitude. This attitude also translated into a demand that the study be ancillary to the curriculum objectives and their implementation in the classroom by the teacher. It also meant that neither too much time could be spent utilizing protocols conducive to a SALT-style learning atmosphere nor could the material be modified to suit the demands of the study.

Thus, the study was carried out within the constraints provided by the routine school situation. However not all aspects of the social medium in which the research was conducted were either neutral or negative. The participating teacher (C.E.G.), a respected teaching practitioner in his school, found support from some colleagues. The extent of the application of S.A.L.T. procedures was ultimately left to his discretion. And there was ample support from the other author.

The Experimental Arrangement

The study was carried out at a junior high school in Des Moines, Iowa. Two other junior high schools served as control schools. The experimental class was taught by the first author; the control classes were taught by equally competent and experienced teachers. A Physical Science course required of all 8th graders constituted the subject matter. The administrative arrangement of schedules in all three schools (experimental and two control) determined that this class would meet every other day during the entire school year for one half unit credit. The class periods lasted 47 minutes. In the experimental school, there were ten sections participating in the study (pooled N = 265). Class size ranged from 18 to 32 students. Control school number one had 83 participating students and one teacher; control school number two had 23 participating students and also one teacher.

Method

Participants. Three hundred and twenty (320) eighth grade students (both males and females) participated in the study. The experimental class was taught by a teacher trained in SALT procedures; the control classrooms were taught by regular teachers.

Classroom arrangement. The classroom was arranged as follows. The student tables were positioned around the perimeter of the classroom with the students facing the walls. Movable chairs, easily rotated in order to pay attention to the teacher upon need, were used. A demonstration table was placed in the center of the room; a blackboard and lecture-demonstration table was located at one end of the room. The location of students seated around the room's perimeter allowed for the formation of a semicircle at the center of which were the demonstration table and the teacher.

Apparata. Equipment used in the classroom, beyond that necessary for subject matter teaching, were a portable stereo phonograph, a cassette tape recorder and six cartriges, and records as listed in Appendices 4 and 6.

Text and instrumentation. The textbook used in all classes was: *Energy, Its Forms and Changes* (Paul F. Brandwein et al., Harcourt, New York, 1972). The measuring instrument was a matching vocabulary test constructed out of a pool of 289 terms in the glossary of the text. There were two comparable forms of the test, each consisting of 31 items.

Classroom procedure. Each session involving the use of SALT procedures went as follows. The teacher begun by stating his expectation that learning will take place in a positive manner. Procedures similar to those used in Benitez-Bordon and Schuster (1976a) were also utilized here. For a more complete description, see Schuster, Benitez-Bordon, and Gritton, 1976. Physical exercises followed the elicitation of learning expectancy (see Applendix 1 for exercises). Mind calming protocols as described in Appendices 2, 3, and 4 were woven into the physical

relaxation exercises as well as following them. Prior to the presentation of the material, the teacher proceeded to use a protocol called early pleasant learning restimulation (EPLR) described in Appendix 5. As the preparatory phase ended, the material was presented in an active, dynamic mode that involved all students. During this presentation, the teacher used dynamic voice tonalities interspersed with whispering enunciation. Body language of the teacher also added emphasis to the presentation of the material.

From the active presentation students were led through a passive session wherein the same material was presented again but in a different mode. This presentation modality involved the use of Baroque music, to which students were asked to listen while the teacher went through the same material at about an equal or slightly higher volume than the music. The students were asked to listen to the music during this presentation and to let the voice of the teacher reach them peripherally. Students were also asked to breathe in a rhythmic mode, and were trained to do so. Self corrected quizzes were administered following these sessions; the papers were not graded and students elected to have their papers graded by the teacher or not. This procedure was followed only in one fifth of the total number of class meetings for one semester. At other times, the teacher followed procedures associated with his regular style.

The control classes were taught by means of instructional styles of the teachers involved, neither by SALT methodology nor the spirit thereof.

Results

Several data analyses were done. First, an analysis of variance of pretest scores showed significant differences ($p < .01$) among the three schools at the start of the year. Refer to Table 1. The scores in the experimental school were significantly lower than in the control or comparison schools. This finding is consistent with Iowa Test of Basic Skills data which showed the experimental school's ability level to be at, or about the lowest in the Des Moines area, and thus well below the initial ability level of the comparison school students. A minor significant effect ($p < .01$) occurred between educational treatment and test sequence; one control school showed Form A as easier; another showed the reverse on pretest schores. Since test forms were administered in a counterbalanced manner, the effect on school ability levels discussed above was negligible.

Due to the significant pretest difference among schools on science achievement at the start of the school year, two complementary analyses were done. These were an analysis of gain scores (posttest-pretest) and an analysis of covariance of posttest scores adjusted for pretest scores.

Table 1. ANOVA Sumary for the effects of educational treatment and test sequence on pretest scores.

Source	MS	df	F
T, Treatment	828.03	2	23.33*
S, Sequence	3.25	1	0.09
T × S	164.43	2	4.63**
Residual	35.48	314	——

**p < .01

Significant treatment means

Educational treatment	Pretest score
Control school 1 (N = 83)	12.14
Control school 2 (N = 23)	14.65
Experimental school (N = 214)	8.09

Treatment X Sequence (test forms)

Control 1, Form A	14.06
Control 2, Form A	13.20
Experimental, Form A	7.41
Control 1, Form B	10.94
Control 2, Form B	15.76
Experimental, Form B	8.86

Table 2. ANOVA summary for the effects of educational treatment and test sequence on gain scores.

Source	MS	df	F
T, Treatment	356.15	2	11.08**
S, Sequence	105.36	1	0.07
T × S	47.40	2	1.47
Residual	32.14	314	——

**p < .01

Significant treatment means

Educational treatment	Gain score
Control 1 (N = 83)	0.76
Control 2 (N = 23)	0.78
Experimental (N = 214)	4.36

Table 3. ANACOVA summary for the effects of educational treatment and test sequence on posttest scores adjusted for pretest scores.

Source	MS	df	F
T, Treatment	228.11	1	7.69**
S, Sequence	391.82	1	13.20**
T × S	59.12	1	1.99
Pretest	5982.17	1	201.59**
Residual	29.68	314	——

**$p < .01$

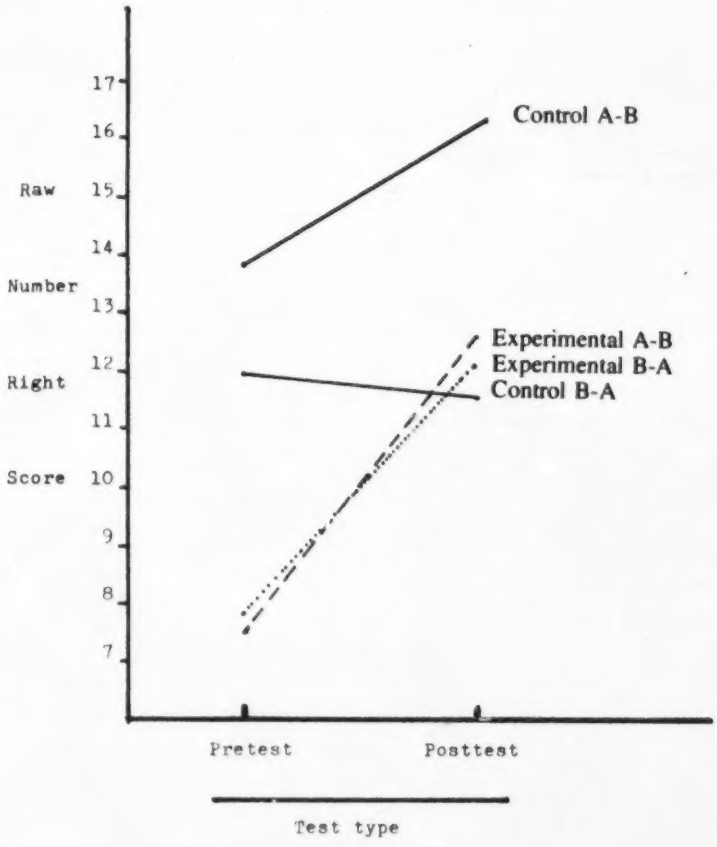
Significant treatment means

Educational treatment	Adjusted posttest score
Control (N = 106)	11.21
Experimental (N = 213)	13.55
Test Sequence	
A-Pretest, B-Posttest (N = 156)	13.95
B-Pretest, A-Posttest (N = 163)	11.64

The analysis of gain scores showed a significant treatment effect ($p < .01$). See Table 2. Students in the experimental school showed an average score improvement of 4.4 vs. 0.8 for students in the control schools. This was measured from the start of the fall semester to its end in January.

The analysis of covariance for posttest scores showed significant main effects ($p < .01$) for both educational treatment and which test form had been given as pretest. See Table 3 and Figure 1. Since there was no significant differences in posttest achievement between the two control schools, their data were pooled. The experimental school had an adjusted posttest score of 13.55, which was significantly higher than the adjusted posttest score of 11.21 for the control schools. Thus the students in the experimental science curriculum gained more in one semester than did the students in the control or conventionally taught schools.

Figure 1. Group means by test type and test sequence.



Second posttest data were available only for the experimental students in May. At the end of the spring semester, students were retested with the same form as in September. Their learning continued at about the same rate as shown in Figure 1, namely a considerable gain over the spring semester.

The significant test sequence effect means that Form B was an easier posttest (Average = 13.95, N = 156) than Form A (Average = 11.64, N = 163). Since the sequence was closely counterbalanced, the effect on the educational treatment variable above was negligible.

Discussion

The amount of time spent on SALT methodology was kept to a minimum of 15 class contacts during the first semester in the experimental class. Although attendance was not a variable measured in the study, it should be reported here that some problems were encountered concerning its effect on attitude toward learning and coverage of material. First, as material was covered, students who had missed classes did not have a chance to make up due to the length of absence (in some cases lasting several weeks). Second, students who had been excused from school by their parents refused to make up work. Other students in the experimental class presented behavioral problems which removed them from class.

Whether measured by gain scores or adjusted posttest scores, the students taught experimentally learned significantly more than students taught eighth grade science the conventional way in the control schools. The SALT methodology seems to have helped even when used a small number of days. Since the comparative gain occurred when using the SALT approach in class only 1/5 of the time, what would happen if it were used for all class periods and under more closely controlled research design and procedures? Further research of the method is definitely indicated.

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Appendix 1. Stretching and relaxing

These exercises were performed at the beginning of the period. Each was done three times by the students standing beside the desk or chair.

1. Reach and stretch—Standing, reach with one arm as high as possible and hold the stretch for 2-3 seconds, return the arm to the side, then reach and stretch with the other arm.
2. Tension waves—Divide the body into six sections, tense one section at a time and hold, progress from feet, to the calfs, to the thighs, to the lower abdominal muscles, to the upper abdominal area, to the chest. Hold, then relax in reverse order. It is possible to do the contractions in wave after a little practice.
3. Three turtle exercises—(a) Tense one side of the neck, then the other side, and the front.
   (b) Let head flop forward and touch the chest, then lift shoulders behind head, then pull head up with the neck tighten the back of the neck; let the head flop forward again.
   (c) Lift shoulder and rotate head with neck tensed 3 times in one direction, then 3 times in opposite direction, turn once or twice without tension.
4. Side bends—Standing straight with hands to [illegible] side, slide hand down the side of the leg below the knee while bending the body sideways as far as possible. Repeat other side.

Appendix 2. Instructions for quiet concentration or mind claming.

Both feet flat on the floor. Hands placed in your lap and your eyes closed. Keep your head up and you will find that keeping the spine straight will let you sit for a long time without discomfort.

To increase our concentration, we will try to stop the external pressure and increase awareness of ourselves. With your eyes closed, try to watch your breathing and say mentally, without moving your mouth, "In" as you inhale and "Out" as you exhale. Don't try to control your breathing; if it speeds up or slows down, let it. Try not to control it. And if your mind starts wandering to other things, gently bring your attention back to your breathing; no need to get uptight about drifting away; do come back to "In" and "Out."

Later when you have practiced well, you will be able to increase your concentration while in other places and at other times, as before a test in another classroom. You will be able to do so by keeping your eyes open and directing them toward something that is stationary, doesn't move, and just going through 8-10 "In" and "Out" cycles.

Appendix 3. Pleasant experience imaging.

These images are used in conjunction with background sounds and pictures of scenes that the teacher can remember very well.
Examples:

Top of a hill or mountain at sunrise.
A walk in the wood.
A walk in a garden to select a favorite flower to have as your own but not to pick it as you may want to return to enjoy it again and again.
A walk by a small stream.
Just sitting by a small lake or pond in the warm sunshine.
Etc., etc.

Appendix 4. Background records from Environments Series

SD66001 Seashore
SD66002 Tintiabulation/Dawn at New Hope
SD66005 Heartbeat/Wind in the trees
SD66006 Dawn and dusk at Okefenokee Swamp
SD66008 Country stream/Sailboat

Appendix 5. Early pleasant learning restimulation instructions

An early pleasant learning experience is to be recalled, whether it is a bedtime story that you enjoyed or a TV program that taught yo something, or a book that you were eager to find out how it ended.

Return to that experience where you were eager to learn and long before you had your memory skills stymied. Get the details of this early learning experience in your mind as fully as possible. Use your

imagination to fill in the following information if you need to, to put yourself in the situation once again. What room were you in? (Pause) Was it a room? (Pause) Try to feel yourself back in the place where it happened. (Pause) Were there people around you? (Pause) Who were they? (Pause) Can you bring back how your hands felt then? (Pause) How did your throat and your head feel that day. (Pause) How did your stomach feel then? (Pause) Can you recall how naturally motivated you were? (Pause) Can you remember that attitude of yours? (Pause) Bring them slowly back with you to the here and now and try to learn and enjoy today in the same way.

Appendix 6. Musical background and passive session music.

Vivaldi—The four seasons
Hubert Laws—The rites of spring
Telemann—Twelve Fantasias for the Hapsichord
Bach—Goldberg Variations
Handel—Sonatas (Trio)
Bach—The Brandenberg Concerti

J. of Suggestive-Accelerative Learning and Teaching, 1976, 1(2)

EDUCATIONAL EXPERIMENT: THERAPEUTIC PEDAGOGY

Cecelia Pollack, Ph.D.
Lehman College, Bronx, N.Y.

I sat in the rear of a classroom in School #122 in Sofia, watching an incredible phenomenon: third-grade children (9-10 years old) rapidly working out lengthy algebraic equations. The children were visibly excited as they worked to solve problems involving logico-mathematical reasoning far beyond that traditionally expected of third-graders under the best of educational conditions.

I couldn't help wonder how Piaget, the well-known psychologist who believed that children go through biological age-appropriate steps of intellectual development, might explain the fact that these children were not playing the game according to his rules. They should not be able to think on such levels of abstraction until adolescence. But when no IQ ceilings are placed on children's potential abilities, creativity in teaching makes leaps in development possible.

The children of School #122 were in no way specially selected. They were kids who attended an ordinary school in an ordinary neighborhood. What was different was that four years ago, their school had been randomly chosen to engage in a long-term research study of the Lozanov Suggestopaedic System. This system, a unique application of the therapeutic-educational theories of the Bulgarian psychiatrist, Dr. Georgi Lozanov, should best be described in the context of Bulgarian education generally.

Schools in this small but thriving country make up a unified system, geared to the educational and developmental needs of all Bulgarian young people.

During a series of interviews at the Ministry of Education, the Faculty of Pedagogy at the University, the Teacher Training Institute and the heads of schools, I learned that only two years ago the school curriculum began to be completely reorganized to meet the demands of the world scientific and technological revolution and the veritable explosion of knowledge occurring today. Educators in Bulgaria therefore saw the need to overcome the traditionalism and formalism of the past. They are now in the process of applying teaching strategies and curricula that will not only advance the knowledge of schoolchildren but will generate post-graduate courses at the university. I saw evidences of these new approaches everywhere I went.

In the kindergartens, materials in the special "math" room make increasingly difficult number and measurement relations tangible and concrete to the child. In special "construction" rooms, spatial relationships and rudimentary laws of physics were taught through play with colored blocks and rods, weights, measures and other materials. The careful step-by-step progression in the complexity of the materials and in

the nature of the challenges to the child demonstrate the sophisticated developmental theory and the serious planning that lie behind these programs.

My visits to classrooms revealed that the textbooks and methods behind this new education are all geared to a problem-solving approach. In classroom after classroom that I visited, children were feeling the inner excitement of meeting challenges successfully. As the teachers asked questions and posed problems, most of the children raised their hands in eagerness to respond.

I wanted to know about school failures. What percentage of children failed to learn their basic skills? I questioned teachers, parents, teacher-trainers, administrators, even children themselves, about school failures. There seemed to be practically none. These appeared to be schools without failure. This was difficult for me to believe coming from a country where deteriorated schools are moving large numbers of children through the grades without their basic literacy skills. But what did Bulgarians do with their potential failures? Surely some children learned more slowly than others?

Their answer was explained to me. They do not believe that intelligence is innate or centrally *controlled*. Therefore, they neither use IQ tests nor standardized tests to track children into "ability" groups. Rather, they do believe that the school learning process itself develops the mental powers of the child. Accordingly, curriculum standards are set for each grade and all children attain them to be promoted. But how is this done since all children do not learn at equal rates?

The normal school day is divided into two sessions, with two distinct professional staffs. Each staff spends six hours in the school, although not all at teaching. The regular curriculum is taught from 8 A.M. to 1 P.M. The afternoon session, from 1 P.M. to 4 P.M. is given over to a more flexible program of extra-curricular activities in the arts, sciences and craft skills. Children join clubs of their own choosing led by qualified professionals in the particular area. "Young Pioneer" group activities, supervised homework where needed, and individualized remediation also take place in the afternoon. In special cases, "logopeds" or special language teachers may be called in to help. The basic thrust of the school is to raise the level of the slow child to meet grade standards by extra individual attention at the first indication of his lagging behind. The strong support he receives prevents his failing.

Imbedded in this already significant step forward in the Bulgarian educational system lies an experiment that may have far-reaching implications: the work being carried out in School #122 by Dr. Georgi Lozanov.

Supported by the Ministry of Education, the School #122 experiment is trying to create a system of learning that not only develops the child's mental powers much faster, but frees his creativity and love of learning at the same time.

The principal of the school confided to me that during the first year of the experiment, absolute chaos reigned. He felt like a fisherman in a boat far from the shores of tradition. Teachers had to be retrained, curricula and materials had to be adopted. There were many critics too. Today, four years later, he proudly corroborated the published research findings of Dr. Lozanov that all grades had completed at least two years of curricula in four months! The math class I described at the beginning of this article more than supports his claim. In a first grade class I visited, the children were reading fluently and discussing an advanced folk-tale on the third-grade level after only four months of school.

This was a development that needed investigation. An interview with Dr. Lozanov himself opened the door for me to view what may well be a break-through in educational theory and practice broad enough to encompass education on all levels.

Dr. Georgi Lozanov, a psychiatrist-teacher became well-known throughout the socialist world for his successful method of teaching adults to speak foreign languages fluently within thirty days. His system is being employed in most eastern European countries as well as Canada, India and even, in a limited way, in our own country. His interest in the education of schoolchildren represents an extension and application of his theories of suggestive psychotherapy. He difines suggestopaedia as:

> *"A system of instruction not aimed solely or maily at improving man's memory. It also stimulates intellectual activity, raises the emotional tone, improves the socio-psychological coherence and has a favorable effect on the whole personality of the students"* (1971).

He recognizes three fundamental psychophysiological principles in his system. The first is that *interpersonal communication and psychological activity are always simultaneously conscious and unconscious*. However, he is quick to point out that it is not the "Freudian" unconscious. He believes that we generally use only a small part of our brain cells in conscious learning, and that a much greater part of the psychological activity takes place on lower levels of awareness. This is not a new concept in this country to those "hidden persuaders" who use subliminal learning for advertising purposes on television.

Lozanov's second principle rests squarely upon Pavlov: *that every stimulus is conditioned, coded, symbolized and generalized.* This principle indicates that environmental stimuli are turned into signals which are able to replace these stimuli and which are then generalized, thus leading to the reduction or telescoping of operations. The third principle, *that every kind of perceptual input is complex*, appears, at first glance, too simplistic, but is not so. Take the perceptual input involved in a communication between pupil and teacher. The language meaning of the message takes place in the pupil's conscious mind. But the teacher's gestures, intonation, facial expressions, all aspects of the same complex perceptual input, also stimulate unconscious mental activity. In this way,

a teacher's low expectations of a child's ability to learn might subtly create unconscious negative tension resulting in a barrier to learning. These are the "peripheral perceptions" which take the form of unconscious emotional reactions, motivations and needs. When learners are freed from such barriers to learning, they are better able to absorb and retain material.

To overcome these inhibitions to learning, Lozanov has developed a system of teaching based on "psychological relaxation." Psychological relaxation is very different from either muscle relaxation or hypnosis. He speaks of it as involving more freedom for the child and a joyful atmosphere where learning can be motivated through the "globally operating emancipating and stimulating factors in the arts." For example, he employs carefully chosen relaxing music as background for certain cognitive generalizations which must be taught. Nor is it music alone that offers the possibilities for introducing material for study. At his Institute, the role of different forms of art, such as poetry, theatre, puppetry, etc. have been studied under different conditions. Specialists have adapted certain operettas, songs, poems, to concrete study material. He describes, as an example.:

> *New material in mathematics was presented to first grade pupils through a theatrical show adapted to conform to the school tasks. At the performance itself while experiencing to the full all the esthetic, ethical and general knowledge aspects of the show, the pupil is imperceptibly also assimilating concrete study material. This material would afterwards be elaborated by teachers trained to teach by the suggestopaedic study system. Such elaboration then takes very little time and is connected with high motivation in the pupils on account of the pleasant experience with which the first perception of the new material is connected*" (1975)

Research studies carried out at the Institute of Suggestology have demonstrated that material thus presented via peripheral perception is not as easily forgotten as consciously mediated material, but is subject to a "curve of recollection" in which long-term memory expands rather than diminishes with time. Not only is memory affected but the entire personality is positively influenced.

At the Institute, a small building in the heart of Sophia, I was invited to view a television performance which demonstrated the use of an art form to carry peripheral perception of teaching material. It was a charming operetta of an adaptation of a Grimm's fairy tale, sung by members of the Bulgarian Opera Company. This was the first showing, and the entire cast, including about twenty schoolchildren, was there to view it. Unobstrusively, the adding and subtracting of two digit numbers, associated with the action in the plot, were flashed at the bottom of the screen. It was this concrete material that would be the text for a month of future teaching by the first grade teacher employing the suggestopaedic method.

I remember the conversation I had had with the Director of the Faculty of Pedagogy at the University about Lozanov. "What is new about Lozanov," the Director said, "is that he takes positive ideas from the past and juxtaposes them to make them useful." A long time ago, Tolstoy demonstrated the great releasing energy and motivational drive of art. His school for children was established upon this principle. But all teachers cannot be Tolstoys, and the value of Lozanov's work was in developing a system that would enable the average conscientious teacher to employ Tolstoy's intuitive approaches. It is an accepted fact that when one is relaxed and experiencing positive emotions that he can memorize more easily. This old truth becomes part of the Lozanov system. What he is attempting to do is to educate through joy and absence of tension.

For me, Lozanov had opened a world of exciting new possibilities for human development, a world in which children could learn in a relaxed atmosphere of pleasure, growing out of the emotional expression of great art, poetry and song. Of importance is that these possibilities are seen to emerge from the creative roots of neuropsychological theory applied and researched.

While the Ministry of Education considers it premature to arrive at definitive conclusions, a great deal of attention and support are offered the experiment. Teams of physicians and other specialists periodically check up on the effects of the suggestopaedic system on the development, state of health and working capacity of the pupils. In all respects, the children appear to have superior rating. The Ministry has recently decided to expand the research to include twelve additional schools. This will test whether replication will reinforce the significant results thusfar obtained.

For educators, the implications of Lozanov's experiment are prodigious. If the results are substantiated as the experiment is broadened, Lozanov will have attained a break-through in education. He will have pointed the way toward educational possibilities leading to the enhancement of knowledge and the enrichment of the human personality far beyond what we now consider possible.

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RELAXATION AND SUGGESTION IN A RECOGNITION TASK*

Julian L. Biggers
Texas Tech University

and

Mathias E. Stricherz
University of New Mexico

In the "duplex theory" of memory, information is passed from the sensory registers to a short-term memory (STM) where the information is held briefly and then forgotten or sent to long-term memory (LTM) for permanent retention. Implicit in this theory is a "gatekeeping" operation that exists between STM and LTM and allows information to be channeled between the two. This control process that allows only selected items to move from STM to LTM often involves a recoding and possibly a transformation for permanent storage and retrieval. Obviously, a degree of energy and effort is involved in operating both the control process and the encoding process.

One might well speculate about the influence of relaxation upon the whole memory function, but especially upon the control process. Would a relaxed state allow the "gate" to be lowered so that information passes more freely from STM to LTM? Conversely, would the relaxed state inhibit even the storage of items in STM, let along LTM?

Investigations of Suggestopedia (Lazonov 1975; Bancroft 1972; Robinett 1975) appear to support the notion that relaxation and suggestion do enhance learning and retention. However, Suggestopedia is a complex mixture of these variables along with the introduction of music as a "carrier" and the personality of the teacher. Research has not been directed at identifying the contribution of each of these variables to the overall effect of Suggestopedia, and the subsequent impact upon learning and retention.

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The Problem

Using a traditional learning paradigm, an attempt was made, in this study, to evaluate a variety of approaches for inducing relaxation and the consequent effect upon retention in short and long-term memory. In addition, the differential effect of auditory versus visual information input was examined.

The basic approaches for inducing relaxation employed in this study were progressive (muscle group), mental (imagery), and a combination mental-muscle routine. A fourth group received only suggestion that higher level mental processes had been attained. This group was included to investigate the merits of suggestion per se and also check on the Hawthorne Effect. Finally, a control group received no treatment but participated in the learning task only. The learning task was presented in two modes: visual and oral.

Method

Subjects

The participants in the study were junior level or above undergraduates enrolled in an educational psychology course. In all, 216 students, 161 female and 55 male, served as subjects. Instructors in ten sections agreed to allow students to be solicited for involvement in the research. At the start of the class period, the students were requested to volunteer for a research project. Questions were advanced to determine if any of the students had been or were presently engaged in Transcendental Meditation, Yoga, Desensitization, currently under medication or any other methods involving relaxation. Students acknowledging any such activity and those not wishing to participate were then excused. The actual participants apparently had never engaged in a formal relaxation procedure.

Stimuli

Twenty words were selected from Bousfield's (1953) list of 60 words. That list is composed of 15, two-syllable nouns from each of four categories—animals, vegetables, names, and professions. The mean frequency of occurance for the words of each category as measured by the Thorndike-Lorge (1944) tables is 7.33 per million. The twenty words selected for this study were evenly divided among the four noun groups and had a mean frequency of occurance of 7.35.

The word list was reproduced on 35 mm slides and recorded on audio-cassette tape for presentation to the groups either in a visual or oral mode. The visual mode consisted of flashing the slides at three second intervals until the list was completed. In the oral mode the words were pronounced one time at three second intervals. Basically, the list of 20 words was presented only once within a 60 second time span.

Procedure

The ten class sections selected to participate were randomly assigned to one of the eight experimental or two control groups. The 5 × 2 × 2 factorial design consisted of five groups (physical, mental, combination, suggestion, and control), by two presentation modes (visual and oral) of the stimuli, and by sex. The directions for the learning task for each group were recorded in order to provide uniformity between the two modes of stimuli presentation. The format for the five groups was as follows:

(1) Progressive Relaxation. This group received the standard procedure for relaxation through the systematic tensing and releasing of gross muscle groups. The routine consisted of telling the students to place their feet flat on the floor, place their hands in their laps, close their eyes and maintain a comfortable position. Then followed a 12 minute routine directing the tensing and relaxing of various muscle groups. At the end of the relaxation routine, the students were informed that they would be involved in an information processing task, to open their eyes, but remain relaxed. The taped directions then led immediately to the presentation of the 20 word list either visually or orally.

(2) Mental Relaxation. The same general format was followed. The relaxation routine solely elicited mental images while the eyes were closed. A pleasant scene, colors, and floating sensations were suggested. The routine was similar to that used to induce hypnosis, but the students were told to remain alert.

(3) Combination. This routine combined portions of the muscle tensing release sequence and imagery of floating and color suggestions in approximately a 1-1 ratio. The time devoted to inducing relaxation was equivalent to both the mental and progressive groups.

(4) Suggestion. This method required the members to place the thumb of the left hand between the second and third fingers and make a loose fist. The subjects were then directed to concentrate on the fist while taking three deep breaths. As they exhaled, the subjects were instructed to count silently "1-2-3." The students were then told to open their eyes and that regardless of how they felt, they were at a higher level of mental functioning. Other than the brief breathing exercise, no effort to induce relaxation was attempted. The five minute routine concentrated on the suggestion that the procedure resulted in higher level mental functioning.

(5) Control. Students in this group were presented with a straightforward request to attend to the stimuli when it was presented and to remember as many words as possible. The task was made to appear as an experiment in information processing alone.

Testing for Short Term Memory

Five minutes after the presentation of the stimuli, the groups were presented with a list of 80 words, the Bousfield list which included the stimuli words plus 20 additional words matched with the original list. The words from the stimuli list were randomly assigned positions with the 60 non-stimuli words. The students were directed to mark as many of the stimuli words as they could recall. The score for each participant was the number of words marked correctly.

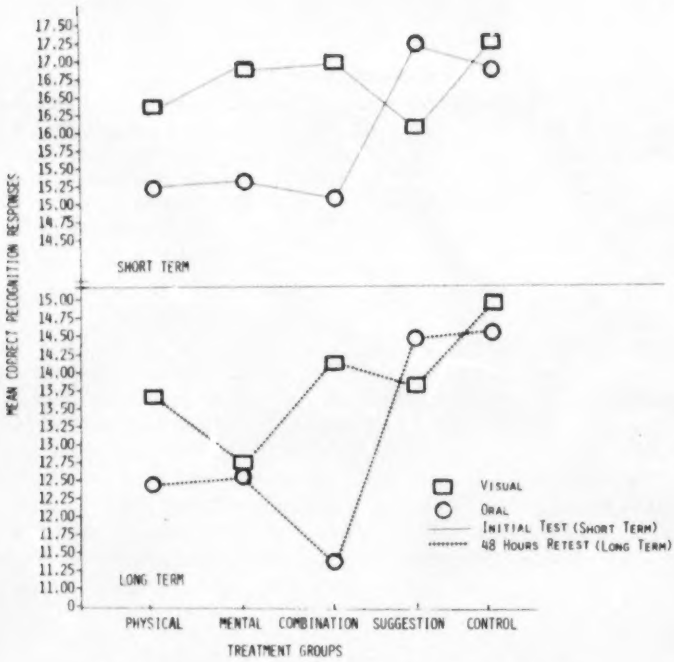
Testing for Long Term Memory

At no time during the initial session were the groups told that they would be retested. Participants were led to believe that the experiment had ended on the first day when they had completed the short-term memory task. Two days (48 hours) later, at the next class session, the students were given an alternate form of the 80 word list. The alternate form was used to reduce the possibility of recall by location of words on the list, and not the words per se. The same directions for marking recognized words and scoring of responses were used as in the prior task.

Results

Examination of the pattern of means for the groups by presentation modes suggested the statistical results that were to follow. Figure 1, a profile of the various treatments and method of presentation, provides perhaps a more illustrative presentation of the various groups on the short and long-term memory tasks. A significant F ratio was demonstrated for the mode of presentation in both short and long-term tasks. Tukeys HSD (kirk, 1968) indicated in both analyses that the visual presentation resulted in the higher group means. This is graphically illustrated in Figure 1 and is readily discernible when viewing that in all but the Suggestion group, the mean visual responses were greater.

A significant interaction effect, Group by Mode (F [4, 197] = 3.34 $P < .01$) during the short-term task was demonstrated. The effect, noted in Figure 1, was a result of all three treatment and control conditions in the oral mode having lower mean correct responses than did those groups under the visual mode. The effect dissipated in the long-term task as the relaxation groups' means appeared similar.



In addition to the difference in presentation modes, in the Long-term memory task, a significant group effect was demonstrated. Dunnett's k-1 treatment and controls test (Kirk, 1968) indicated that the Physical, Mental, and Combination relaxation groups had significantly fewer correct recognition responses than did the Control group. The Suggestion group mean approached being significantly greater than the three treatment groups.

Discussion

The results of this study offer several intriguing conclusions as a result of the differential effects of method of presentation and effects of relaxation in a long-term recognition task. The major conclusions advanced are these: visual input appears superior to oral input of stimuli material in both short- and long-term memory tasks with relaxation at acquisition, and relaxation at acquisition of information appears to inhibit retention, at least, in long-term memory.

As a check on possible acoustical errors that may have accounted for the observable difference between visual and oral presentation modes, a frequency count of missed responses was completed. None of the words had a noticeable frequency of misses related to presentation mode. With this in mind, the data obtained by Paul and Trimble (1970) that suggested

taped presentations of relaxation sequences are superior to live-oral presentations in reducing autonomic arousal and that no difference between relaxation groups and controls in the effects of autonomic arousal reduction exists in either the taped or live conditions, seem contrary to the data observed in this study. Our data suggest that both the efficacy of information through visual channels is superior in learning to audition, and more importantly, that a difference exists in learning (possible similarity with arousal) between relaxed and non-relaxed (control) states.

The findings that relaxation during acquisition of information was less effective than controls is counter to a majority of Suggestopedic literature and begs future clarification. However, the pattern of means (see Figure 1) that shows the importance of Suggestion under both presentation modes, raises the question of its influence on Suggestopedic findings.

The data observed in the long-term memory task indicated the control group performed with greater efficiency than did the three relaxation groups. Straughan and Dufort (1969) found that when anxiety effects on recall abilities were studied, relaxation on immediate (short-term memory) tasks for high anxious groups facilitated latency of responses to a greater extent than for low-anxious groups. Our data support these conclusions in that the relaxation groups at long-term (comparable to low-anxious) performed significantly poorer than did the control group (high anxiuos group). Relaxation before learning in Straughan and Dufort's study intensified the low-high anxiety groups incongruence of effects. A tenable conclusion from Straughan and Dufort may well be that the anxiety of a subject is a factor in verbal learning paradigms, our data indicates that relaxation may eliminate anxiety, and in fact, be detrimental to the storage and retrieval of information in LTM.

Conclusions

The three approaches for inducing relaxation (physical, mental, combination) appear equivalent in potency under the conditions present in this study. The results suggested that a relaxed state, however achieved, inhibits retention in long-term memory when compared to the use of suggestion or the more traditional approaches to memorization (rote/control). Of further interest is that visual presentation of information following relaxation is more productive during recall than is oral presentation. It would appear that the control process in a "gating" system of information storage and retrieval is indeed effected by relaxation, and that items moving from STM to LTM are affected by relaxation in a negative manner.

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Adapting the Lozanov method for remedial reading instruction

Allyn Prichard
Iowa State University

and

Jean Taylor
DeKalb County School District

Abstract

Twenty remedial reading students at Huntley Elementary School (DeKalb County School District, Georgia) were instructed through a teaching methodology employing the basics of the Lozanov system. The researchers attempted to refine their approach to certain elements e.g., relaxation, breathing and visualization and test the adoptability of those elements to the American public school setting. Large pre-post gain scores were obtained for those students able to master the basic relaxation technique; lesser gains were recorded for those who did not.

Introduction

Lozanov-type work began in Georgia in September of 1974 with discussions between the two authors concerning how an attempt might be made to begin the adaptaion of Suggestopedia to remedial reading. It was decided that it would not be possible to lift Lozanov's foreign language instructional proceedings and apply then to reading without considerable change of sequencing. It was also felt that it would be advantageous to the researchers to undertake such instructional changes over a period of time, thus allowing them to add or modify elements of the methodology as they saw fit.

Instruction actually began in October, 1974, when one student was selected for a trial run of the procedures. This seventh grader was most helpful to the investigators: he was most happy to supply metaphors describing the ways things looked to him when relaxed. Thus, it was possible to construct suggestions for relaxation which included such statements as "Your head feels like a marshmellow . . . your eyes are relaxed, just like nerf balls . . . your arms are relaxed, just like spaghetti as it falls from your fork," etc.

In november, three small classes containing a total of 11 students began the new program. Classes were divided into two parts, passive and active.

During the passive session, students lay on the floor, closed their eyes and relaxed. Soothing classical and semi-clasical music was then played to them. The students were instructed to take three deep breaths, then the teacher counted from 10 to 1 backwards, with the suggestion that as she counted further physical relaxation, the teacher read suggestions for relaxation of the body parts from head to toe. The story for the day was read three times. During each reading, the sentences if the story were given in varying intonations as described by Lozanov (declarative, ambiguous, loud). Students were encouraged to listen to the music and let

the words bring images to their minds. Suggestions were given for general academic excellence, then the students were returned to their normal state by counting forward from 1 to 5.

During the active session, each student read aloud a portion of the story previously presented. The teacher corrected any mistakes in a firm positive manner. A comprehension check was given, with students grading their own papers.

Method

Subject. Students eligible for participation in the program were defined as those for whom the average of their Spache Oral and Silent reading subtest scores was two years less than their Spache listening potential (expectancy) scores. The twenty (20) participants were *randomly* selected from the eligible group by the DeKalb County reading coordinator assigned to the Huntley Hills geographical area. The sample included three students classified as SLD (having specific learning disabilities) and two as EMR (educable mentally retarded). Ages ranged from seven (7) to thirteen (13); grade placement ranged from third year primary (repeating second grade) to the seventh grade.

Procedures. Two basic components of the Lozanov approach were emphasized by the researchers. Those elements are (1) presenting lesson matter in both attentive and non-attentive states (alternating levels of awareness for presentation of the same material) and (2) attempting to create a relaxed, non-defensive atmosphere in which both external and internal distractions to learning are minimized.

In this study, several refinements over the previous year's method were attempted as well. They are discussed in detail below.

Refinements. Several modifications were undertaken in this year's procedures. These included: selecting music of the exact type specified by Lozanov, insert a combination breathing/material presentation cue on the musical type, relaxation/visualization/breathing practice, dramatic enactment of the stories being studied, and guarding against student boredom by rotating five routines as means of induction visualizations into the passive state.

(1) Music selection/cueing breathing and lesson material presentation. In the Lozanov manner, Baroque music written in 4/4 time was included in this year's program. Mr. John Rhodes (music consultant, Georgia Department of Education) selected the proper music and recorded it on tape. He then listened to a playback of the music and by using a wood block and mallot recorded a click on the first beat of each measure. This click was to serve as a breathing cue (generally not followed by the students in practice), and as a "presentation of material cue" for the instructor (precisely followed).

(2) Relaxation/Visualization/Breathing practice.

The first two weeks of the 14 week program were devoted entirely

to preparation for the 12 weeks of instruction to follow. Students were taught basic relaxation by taking three deep breaths, then listening as the teacher counted from 10 to 1 and gave suggestions for progressive relaxation by body parts, a la Joseph Wolpe. Students were then given visualization practice through a series of 5 exercises, each suggesting successively more complicated visual imagery. The main themes of the exercises were (1) visualizing colored walls, (2) visualizing and tasting fruit, (3) visualizing and feeling various textures (wood, velvet, etc.), (4) going on a visualization tour of the classroom, (5) taking a raft trip down the Chattahoochee River.

Breathing practice consisted simply of encouraging students to breathe in on cue (the previously described click on the musical tape) and to breathe out on the following click. This was generally unsuccessful, particularly among the younger students. Future efforts will focus on breathing, relaxation, and visualization in that cumulative order.

(3) Drama

An original play was written by the teacher for each Barnell Loft story. Students were assigned roles; appropriate, informal costumes were worn. The teacher directed the play in a positive but forceful manner.

(4) Induction methods.

Five visualization routines (one used during the 2 week "practice session") were written to speed induction into the passive state and to further develop visualization power. The five routines had as their theme (1) trip down the Chattahoochee River, (2) eating spaghetti (3) riding down the escalator in a local department store, (4) snowflakes falling in a storm and (5) an eagle soaring around sea cliffs, then dropping toward the sandy beach.

The "suggestopedic cycle" adopted by the researchers consisted of two 45 minute class sessions (on consecutive days) spent on the same lesson material. Each session contained both active and passive activities.

Session 1

(a) ACTIVE

Commercially produced games were played, each designed to aid students in acquiring the basic phonics skills (consonant, vowels, digraphs, etc.).

(b) ACTIVE

Presentation of new vocabulary through an approach combining contextual and kinesthetic methods. Each new vocabulary word was paired with a sentence in which it was used. e.g. where _____ was the cat going? The student traced over the new word in isolation, wrote it in the sentence, then read it to the other group

members. Sentences consisted of minor structural and wording changes from the story lesson material presented later. An average of eight new vocabulary words were presented in this component of session 1.

(c) ACTIVE

Dramatization: A play was enacted, written by the teacher from the lesson material (Barnell Loft, A,B,D,E). Each child had a part in the script and was dressed in a make-shift costume appropriate to his/her role.

(d) PASSIVE

(1) Students lay down on rugs, closed their eyes and breathed to the beat of a metronome.

(2) Visualization suggestions lasting three to five minutes were given, taking the class on fantasy trips designed to exercise their visualization faculties. Five separate story themes were employed, alternating Monday through Friday to eliminate the danger of boredom.

(3) Suggestions were given which emphasized the worthiness and uniqueness of each class member. Further suggestions described the "magic drawing board" on which the vocabulary material would be visualized.

(4) Presentation of instructional material: The teacher read the vocabulary material over a musical (Baroque, 4/4 time) background according to the following rhythm and intonation pattern.

(i) First quarter note beat of a measure: Pronounce vocabulary word.

(ii) First quarter note beat of the following measure: spell vocabulary word.

(iii) First quarter note beat of the following measure: use vocabulary word in a sentence.

Following the Lozanov pattern, the intonation used was normal (declarative). The second vocabulary word was presented in the same three-part manner and rhythm, this time in a whisper. The third vocabulary word was presented in the same manner and rhythm but with a loud dramatic voice.

The students were instructed to breathe in on the first quarter-note beat of each measure and out on the first quarternote beat of the following measure. Presentation of material and breathing were thus coordinated with each other, cued by a click supplied on the musical tape at the proper interval.

(5) Suggestions for general academic health and excellence.

(6) "Coming Out" (counting forward, 1 to 5)

(e) ACTIVE

Oral check of words presented initially (re-reading the day's vocabulary list).

Session 2

(a) ACTIVE
Phonics Games

(b) ACTIVE
Vocabulary Review of word list presented in Session 2 (oral reading only).

(c) PASSIVE
(1) Students lay down, relaxed and breathed to the beat of a metronome as before.
(2) Visualization suggestions as before.
(3) Other suggestions, as before.
(4) Presentation of material: The instructor read one page directly from the Barnell Loft material according to the rhythm previously described, beginning each sentence on the first quarternote beat of the measure beginning after the completion of the previous sentence. Intonations were alternated as before. Students were again instructed to breathe on cue with the click signal provided in the tape and were encouraged to visualize the scenes described by the story. After the story, the vocabulary was presented again, as on the previous day.
(5) Suggestions for general academic excellence and health.
(6) "Coming Out" (counting forward, 1 to 5).

(d) ACTIVE
Students read story orally while the instructor noted any vocabulary errors.

(e) ACTIVE
Comprehension check-up, using questions provided in the Barnell Loft Series. Results were charted daily.

Results

Gain scores were high on the oral reading and silent reading subtests, less so on the word recognition subtest.

In summary,

(1) 16 of 20 participants (80%) gained a year or more on the oral reading subtest.

(2) 15 of 20 participants (75%) gained a year or more on the silent reading subtest.

(3) 9 of 20 participants (45%) gained a year or more on the word recognition subtest.

Table 1

Spache subtests gains by class, grade placement, length of instruction, attendance, and quality of relaxation response.

Class	Ss	Age	Grade Plcmnt	Gain scores* WR	O	S	Length (45 min. daily)	Days present	Relaxation Response Quality**
Class 1	1	10	4	.5	1.0	.5	70	70	P
	2	8	3P***	.5	1.2	.5	70	69	G
	3	8	3P	2.2	1.5	1.5	70	69	E
	4	8	3	1.2	1.7	1.7	70	70	G
Class 2	1	11	6	.0	.5	.6	70	65	G
	2	7	3	.7	.2	.6	70	69	P
	3	9	3P	.5	.5	1.3	70	69	G
	4	8	3	.5	.5	.5	70	60	P
Class 3	1	9	4	1.0	1.0	1.7	70	70	E
	2	9	4P	1.5	1.7	1.7	70	65	P
	3	9	4	1.5	1.9	1.2	70	65	G
	4	13	7	1.7	2.8	2.0	70	66	E
Class 4	1	13	7	1.0	2.5	2.0	70	65	E
	2	11	5	.0	2.0	1.0	70	70	E
	3	11	5	.0	2.0	2.0	70	68	E
	4	12	6	.7	1.3	1.0	70	65	E
Class 5	1	8	3	1.5	1.5	1.2	70	69	E
	2	9	4	.5	1.3	1.5	70	69	P
	3	9	4	1.0	1.2	2.2	70	69	G
	4	10	4	.5	1.0	1.5	70	63	P

* *Spache subtest descriptions:* WR, word recognition; O, oral; and S, silent reading. Gain scores indicate change in reading levels.

** *Relaxation response quality:* E, excellent (eyes closed, no body movement); G, good, (eyes closed, minimal body movement); and P, poor (eyes open, frequent body movement).

*** *Grade placement:* 3P (third year primary, repeating second grade); 4P (fourth year primary, repeating third grade).

Table 2
Frequency count of Spache subtest gain score ranges.

Subtest	No Gain	Gain up to .9	Gain 1.0 to 1.9	Gain above 2.0	Total
WR	3	8	8	1	20
O	0	4	12	4	20
S	0	5	10	5	20

When results are broken down according to the degree to which participants are able to achieve and maintain the relaxed state essential to the passive component of the program, further useful information is obtained.

Of those participants who experienced an "excellent" relaxed response,

(4) 8 of 8 (100%) gained a year or more on the oral reading subtest.
(5) 8 of 8 (100%) gained a year or more on the silent reading subtest.
(6) 7 of 8 (87.5%) gained a year or more on the word recognition subtest.

Of those participants who experienced a "good" relaxation response,

(7) 4 of 6 (67%) gained a year or more on the oral reding subtest.
(8) 4 of 6 (67%) gained a year or more on the silent reading subtest.
(9) 3 of 6 (50%) gained a year or more on the word recognition subtest

Of those participants who experienced a "poor" relaxation reponse,

(10) 4 of 6 (67%) gained a year or more on the oral reading subtest
(11) 3 of 6 (50%) gained a year or more on the silent reading subtest
(12) 1 of 6 (17%) gained a year or more on the word recognition subtest.

The average gain scores of the participants who experienced an excellent relaxation response were:

WR — .01 yr.
O — 1.83 yrs.
S — 1.55 yrs.

These data further underscore the strong results obtained for those students who could "let go" and (presumably) visualize the lesson material as it was read to them in a deeply relaxed state.

Discussion

When 16 of 20 participants (80%) gain a year or more on the Spache oral reading subtest after 14 weeks in the program (including only 12 weeks of actual reading instruction) one can hardly help being encouraged by such results.

When 15 of 20 participants (75%) gain a year or more on the Spache silent reading subtest in the same comparatively short time frame, one feels the same over the prospects of future applications of Lozanov's technology.

Only 9 of 20 participants (45%) gained a year or more on the word recognition subtest. However, the researchers were aware of the fact that the vocabulary words tested by the Spache WR subtest were generally not those selected from the Barnell Loft material for presentation in class. The Spache WR subtest is comprised primarily of nouns, not of basic sight words as defined by tests such as the Dolch. The Barnell Loft material lends itself to teaching basic sight words which the researchers chose to present, knowing that they would be more difficult for remedial students to learn.

Succinctly stated, this research seems to indicate that using Lazanov-type procedures for teaching sight word vocabulary in fully explored context (paper and pencil tasks, dramatization and altered states visualization) greatly facilitates scoring on Spache oral and silent reading subtests, particularly by those students who are able to relax. This procedure had a much lesser effect on tasks which were not undertaken, such as learning nouns in isolation as measured by the Spache WR subtest.

Table 3

Frequency count of Spache subtest gain score ranges according to relaxation response.

Level of relaxation response	Subtest	No Gain	Gain ranges Up to .9	1.0 - 1.9	Above 2.0	Total
Excellent	WR	2	1	4	1	8
	O	0	0	4	4	8
	S	0	0	5	3	8
Good	WR	1	2	3	0	6
	O	0	2	4	0	6
	S	0	2	2	2	6
Poor	WR	0	5	1	0	6
	O	0	2	4	0	6
	S	0	3	3	0	6

Mastery of some sort of relaxation technique may conceivably become a regular part of a child's educational experience, should Lozanov's methodology attract further attention. This study also indicates that many (in the Huntley Hills case, 30%) elementary school children may not be "ready" to learn to relax deeply. Certainly SLD children (class 2, student #4) who have hearing impairments may neither respond to relaxation suggestions nor to precisely timed oral presentations of material. Thus it may well be that there is a lower age limit for partipant inclusion in instructional methodology of this type.

Summary/Conclusion

The researchers are optimistic over the prospects of adapting Lozanov-type methodology to the American public school setting. As more data is generated by researchers with increasing interest, improvements in applying his approach will likely occur.

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The Effects of the Alpha Mental State, Indirect Suggestion, and Associative Mental Activity on Learning Rare English Words*

D. H. Schuster
Iowa State University

Abstract

This study investigated the effects of the alpha mental condition, indirect suggestion, and associative instructions on the learning of rare English words. A within-subjects or subjects by treatment ANOV design was used such that all of the eight trained subjects were exposed to all of the experimental conditions. Subjects were well trained with biofeedback devices to produce the alpha mental state upon demand or its complement, stay out of the alpha state upon request. Indirect suggestion was used by having subjects remember their memory skills in an early, pleasant learning experience. Subjects were asked to make unusual associations between the rare word and its common synonym. The main effect of asking subjects to make unusual associations was very significant and subjects did better when making these unusual associations. The interaction between suggestion and association was significant in that subjects did better when asked both to remember an early, pleasant learning experience and then to make unusual associations with the words to be learned. There were several interesting but not significant trends involving the alpha mental condition. There was a trend for the alpha state to result in improved learning when neither associations were requested nor the early pleasant learning experience suggested. In other cases the alpha condition resulted in somewhat poorer recall.

Introduction

The purpose of this study was to investigate, 1. the effect of the mental alpha state on learning, and 2. the effects of indirect suggestion and associative mental activity on learning rare English words.

Quieting exercises and indirect suggestions have been used by Lozanov (1971) to speed up language learning greatly. Because the alpha state subjectively is reported by subjects as being quiet, calm, but alert by Kamiya (1969), it was felt that the two types of experimental approaches should be brought together in one study. Studies by the writer (1972, 1976) provided significant support. A study by Chaney et al. (1972) also supports this contention by their conclusion that subjects taught relaxation techniques did better than controls on a recall test of random numbers.

A separate factor that results in improved memory is the use of unusual verbal or imaginal associations. See for instance Day (1971), Aiken (1971) and Miller et al (1960).

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*A note of appreciation goes to Kathy Mueller, Rick Watson and Steve Wetter for their long and arduous efforts in data collection for this study.

Accordingly, the major hypothesis in this study was that language learning would be faciliated by the giving of ego and memory strengthening suggestions while a subject was in the relaxed but alert mental state categorized as the alpha state. It was also hypothesized that the person's mental activity in making meaningful associations out of difficult language words would also speed learning and this would be facilitated further when in the alpha state.

Design

Table 1 lists the variables involved in this study. The first independent variable was that of the alpha state of the subject, alpha or non-alpha. This was manipulated simply by asking the trained subject to produce the alpha state on demand or the non-alpha state. The second independent variable was that of indirect suggestion. Refer to the appendix for the wording used to induce this learning suggestion indirectly via remembering an early pleasant learning experience and maintaining the same eager motivation to learn and the attendant high memory skill. The third independent variable in the study was that of the mental activity requested. Under the associative condition, subjects were requested to make odd, weird, figurative or highly unusual associations between the rare word being learned and its paired common synonymous associate. Subjects was the last independent variable, constituting replications. They were eight trained subjects proficient at getting readily into or out of the alpha state on demand. Subjects were assigned in sequential order over the eight previous experimental cells to control for the effects of fatigue, practice, or boredom.

Table 1. Variables involved in studying the effects of the alpha brain state, indirect suggestion and associative mental activity on learning rare English words.

Independent Variables	**Levels**
1. Alpha condition: 1-non-alpha, 2-alpha.	2
2. Suggestion: 1-none, 2-remember early pleasant learning.	2
3. Word association: 1-none, 2-make odd, weird associations.	2
4. Subjects: 1-8, counterbalanced over about 8 cells.	8
Control Variables	
1. Amount of alpha from machine during learning: 1-none through 5-moderate (50%) through 9-complete.	9
2. Word list: 1-8, counterbalanced over 8 cells and 8 subjects.	8
Dependent Variable	
Number of meaningful but rare English words known, 12/list.	

Mental state control was checked twice. An estimate was made by the experimenter of the amount of alpha emitted by the EEG monitor during a learning trial. For the non-alpha condition, this rating should have been the lowest, "one." For the alpha condition this should have been nine, or "complete" alpha. Second was the amount of alpha from the machine during the recall or test phase. Subjects were requested to stay out of the alpha state for this. Ratings consequently during recall should have been the minimum alpha or the "one" category.

Word list difficulty was also a controlled variable. Possible differences in the word lists were controlled by having the word lists given randomly to a particular subject for a particular experimental treatment according to a Latin square design. In this design, a given word list was taken just once by any subject and was assigned just once to one of the eight experimental cells in a random order. In addition, the word lists had been screened rather carefully for previously known words by the experimenter and his associates. The meaningful word lists were constructed on the basis of non-technical words unknown to the principal experimenter that occurred in the unabridged dictionary. Words used started with relatively common consonants and were composed of two or three syllables. The same initial consonants of words were used for all eight lists but the words were cycled in a systematic order. While one random sequence of initial consonants was used in all lists, the starting point in the lists varied systematically so that the lists started with different initial consonant words.

The criterion or dependent variable was the number of words recalled correctly in each list of 12 words.

Procedure

Subjects were recruited from students interested in learning to control their brain waves. In the training phase subjects were given access to two EEG feedback devices giving an audible indication of their brain state instantaneously. Training was continued until the subject could produce alpha 75% of the time or better when requested, and 25% or less when requested not to. After subjects became suitably proficient at controlling their brain state they were put through the eight experimental treatment conditions of the three independent variables as outlined previously.

A special procedure during the tape recorded oral presentation of the meaningful but rare English words was used. Subjects were requested to indicate promptly if they knew the rare word they had just heard. When such a case was encountered, the experimenter substituted another meaningful but rare English word with the same initial from a ninth and spare list. This occurred twice; two subjects knew one word (different words) in just one list each. The procedure used to check for and discard previously known words was, a. Before any lists are presented, ask

subject to tell experimenter immediately if and when he already knows any word presented. If so he gets an alternate word starting with the same letter, b. After each list has just been presented, ask subject if he knew any of the 12 words. If so, give an alternate immediately, c. Test for recall. Start with 7th word as presented and go around to number 6 last.

Results

Since a within-subjects or subjects by treatment design was used in which all subjects took all possible treatments, pooling of the treatment by subject terms was possible. Before pooling however, the subject by treatment interaction terms were checked for homogeneity using the F-max test (Winer, 1971). Pooled Error two in Table 2 represents the pooling of the four highest order subject by treatment interaction terms as the F-max test was not significant ($F_{max} = 3.76, k = 4, df = 7, p > .05$.) Correspondingly, the pooled Error one term in Table 2 represents the pooling of Error 2 with the next three lower subject by treatment interaction terms ($F_{max} = 9.39, k = 7, df = 7, p > .05$). The Error three term in Table 2 simply was the triple interaction of the three fixed effects with the Subjects variable. Error three was used to test the triple fixed interaction.

Table 2. ANOV summary for the effects of alpha mental state, indirect suggestion and association instructions on the learning of rare English words.

Factor	MS	df	F
M, Mental state (alpha)	2.64	1	0.89
S, Suggestion	1.27	(1	0.43
A, Association	40.64	1	13.83**
Pooled Error 1	(2.94)	(49)	——
M × S	0.02	1	0.01
M × A	5.64	1	2.41'
S × A	11.39	1	4.87*
Pooled Error 2	(2.34)	(28)	——
M × S × A	4 52	1	3.57'
Error 3	1.27	7	

**Significant at $p < .01$ *Significant at $p < .05$ 'Probability approached .05

Significant treatment means

Association

No association: 3.34 Association: 4.94

Suggestion by Association

	No association	Association
Suggestion:	3.06	5.50
No suggestion:	3.63	4.38

The effect of Association was significant ($p < .01$) as indicated in Table 2. The interaction of Suggestion and Association was significant ($p < .05$) and this interaction is graphed in Figure 1. Finally, there was an interesting trend in that the interaction between the Alpha state and Association approached significance at the 5% level.

Discussion

Initial interest centers on the mental state or alpha variable and its interactions with the other two independent variables upon learning. The main effect of the alpha state was not significant nor was there an encouraging trend. Concern exists next at to whether the subjects were controlling their alpha mental state as requested. This was checked by comparing the experimenter's estimate of alpha production in the two experimental learning conditions. These rating averages were: 1.66 (''stay out of alpha'') vs. 7.84 (''produce alpha''). These ratings were quite close to the desired limits of alpha mental control and were very significantly different, ($F = 89.45$, $df = 1/7$, $p < .01$). Thus, subjects were quite proficient in controlling their mental state as requested during the experiment.

A nonsignificant but interesting trend was the interaction of the mental state and the instructional variable. There was a trend for more words to be recalled when in the non-alpha state and when given directions to make unusual associations between the rare words and common synonyms. This trend ought to be explored further as possibly increased precision over the control of the alpha state or the use of more subjects would prove this trend to be significant.

The last interesting but nonsignificant trend is that for the triple interaction of the alpha Mental condition, Suggestion and Association upon words recalled. The best alpha condition was when no suggestion and no association instructions were given, the number of words recalled correctly was less when in the alpha condition than in the non-alpha condition, the contrary of what was expected. These results suggest that it takes a certain amount of mental effort for a subject to maintain himself/herself in alpha state and that when you give him/her additional instructions beyond maintaining oneself in the alpha state that something suffers, either ability to maintain oneself in the alpha state or the ability to recall words. This conclusion is consistent with Lozanov's (1971) reported finding that students produced 10-15% more alpha when in the passive presentation phase (without instructions to make images) than in the active presentation phase with imagery instructions. Integrating Lozanov's result with the lack of significant learning enhancement when in the alpha state from this study leads to the conclusion the alpha state itself does not produce superior learning.

As expected from Aiken (1971) and Day (1971), the directions to make unusual or weird associations produced an effect significant well beyond the one percent level. The means are shown at the bottom of

Figure 1. The effects of association instruction and indirect suggestion on number of words learned.

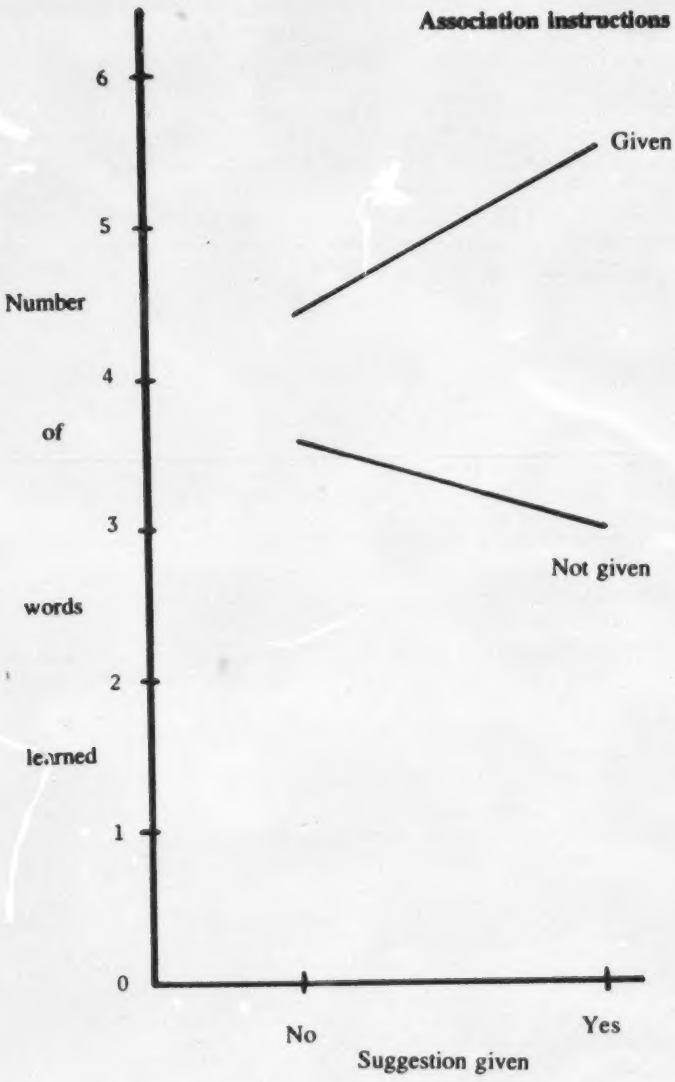

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Table 1. In addition, there was a significant interaction between the suggestion variable and association variable. These results are shown in Figure one. The two variables interacted cumulatively: the most words were recalled correctly when subjects were told both to make unusual associations between the rare words and their common synonyms and had been previously told to return to an early pleasant learning experience and retain that top memory skill. This interaction effect is consistent with Lozanov's suggestopedia (1971) and should be explored further.

In summary, there was no significant support for the expected interaction of the alpha mental state in conjunction with suggestions and association variables. However, there was an interesting significant interaction cumulatively between the association and suggestion variables. There were several nonsignificant trends suggesting that maintaining oneself in the alpha state and being required to make unusual associations detracts from one's ability to recall words correctly. Further research is definitely indicated and should include long term memory in addition to immediate or short term memory as investigated herein.

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Appendix

Instructions fot the experimental condition of early pleasant learning recall.

"Pick some early pleasant learning situation, some time in your life previously when you were learning something that you realized you liked and you really enjoyed it. This may be as early as several years of age when your mother was reading to you or it might be as recently as reading your best liked fiction story only a year ago. Everybody got one? (If not, wait.) Be back there again and find yourself enjoying learning. Think about where you were. (Pause) Was anyone with you? (Pause) What was your attitude or how did you feel about what you were reading or learning? (Pause) Now take a look at yourself in this learning situation and how your mouth and throat felt. (Pause) Recall now how your stomach felt. (Pause) Recall how your whole body felt. (Pause) Take a look at how your head felt. (Pause) Now think about the thoughts you were thinking. (Pause) Take a look at the eager feelings you had about learning and reading. (Pause) Maximize that feeling of being eager to learn what was happening in the story, liking the reading. (Pause) Maximize that feeling, hang onto it, and learn the material you are about to hear in exactly the same way. Retain that eagerness to learn and top memory skill and learn these words the same way."

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The Effects of Imaging Ability, Prepared Images and Sex of Subject on Learning English Words

D. H. Schuster, Mark Stavish, and Margaret Burchinal
Iowa State University

Abstract

This research investigated the effects of self-reported imaging ability, mnemonic images as prepared by the instructor or the student and sex of subject on the learning of rare English words over 12 lists. The subjects were students from beginning psychology classes at Iowa State University and received research credit for being subjects. A full factorial analysis of variance design was used. Imaging ability did not significantly affect how many words students learned. The effect of source of image preparation was not significant for the first block of four lists, but was significant for the second and last blocks as well as overall. After the first block, subjects producing their own images, instead of using those supplied by the instructor, performed significantly better; this was unexpected. Females performed consistently better than male subjects for the second and last blocks of lists. A triple interaction occurred for the last block of lists; the interpretation is obscure.

The purpose of this research study was to investigate the effects of visual imaging ability as self-reported, images as prepared by an instructor or the student, and sex of subject on the learning of rare English words consecutively over 12 lists of 25 words each.

The research literature points out that images are definitely helpful in learning. Johnson-Laird (1974) reviewed imagery research. Some situations are likely to inhibit the use of imagery and certain individuals are likely to be incapable of forming sensory images. Nevertheless, imageability seems to be an important variable. Atkinson (1975) discussed vocabulary learning with what he called the "key word method." This method divides vocabulary learning into two stages, the first of which requires the learner to associate the spoken foreign word with a key word which sounds like the emphasized or accented syllable in the word to be learned. The second stage requires the learner to make a mental image of the key word's interacting with the English translation in a paired associate manner. Atkinson reported that this method was very effective in students' learning foreign language vocabulary. Day (1971) compared the use of implicit versus explicit cues in using the peg word technique; her results suggest that there is essentially no difference between imagery and verbal mediation, both of which are superior to no mediation in learning words. Imagery plays a key role in accelerated learning (suggestopedia) as propounded by Lozanov (1971) and as corroborated clinically by Schuster (1976).

Method

This was a three factor between-subjects analysis of variance design. The variables are described as follows.

The image preparation independent variable was operationalized as follows. In the instructor-prepared image condition, the researchers carefully had prepared images for the subjects to use in learning the common meanings of the rare English words. An example is the use of learning a person's name such as "Schuster." The directions for image formation in this case would be as follows, "When you meet a person with the name 'Schuster,' visualize this person's walking barefoot carrying his shoes in his hands. Then see this person going to a shoe repairman, saying to the repairman in turn, 'Mr. Schuster, fix my shoes.' In the self-prepared image condition, the students were not given the instructor's prepared images, but were given examples such as the above, and told to generate their own images as fast as they could to the words as they were presented in each list.

The second independent variable was imaging ability which was operationally defined as follows. The Switras (1975) Survey of Mental Imagery Form B was given to approximately 100 subjects in a preliminary step before the research proper. As the title implies, it is a test of imagery across visual, auditory, tactile and oth r sensory modalities. Subjects are asked to make two responses to each question, whether the subject could get an image or not (rated on a No, ?, Yes continuum) and secondly, the vividness of that particular image if present, and rated on a Likert scale ranging from one, absolutely no image, through 5, the image was very distinct and really happening. All of the items in the test were scored here only on the "yes" answer and the number of "yes" responses was arranged into a continuum from low to high. The top scoring eight subjects of each sex were randomly assigned to levels of the previous independent variable of image preparation; similarly the bottom scoring eight subjects of each sex we e assigned likewise. These assignments were subject to the condition that four subjects of each sex were assigned to each condition of image preparation.

It should be noted that the use of self-reported imaging ability is not quite the same thing as actual visual or auditory imaging ability as measured objectively. However, Switras (1975) reported that there was a significant validity coefficient for his test, that is subjects who scored highly on his test were also higher on other objective tests of imaging ability. Therefore some confidence can be given to this procedure for selecting subjects on the basis of self-reported imaging abilities.

Sex of subject was the last independent variable, namely male or female. The 32 subjects were all recruited from students taking beginning psychology classes at Iowa State University and they received research credit for having taken part in this research study. There were four subjects of each sex in each cell of the four possible combinations of imaging ability and image preparation.

The dependent variable was the number of words correctly defined in immediate recall from twelve carefully prepared lists of 25 rare English words each. These lists had been carefully prepared by the senior author and the lists were generated on the basis of random assignment of previously screened rare words to each of the twelve lists. Thus the twelve lists were of approximately equal difficulty. The initial screening criterion was that the senior researcher and his co-workers did not know any of these words. An example is "maremma," a seaside marsh. These words were so rare that is was extremely uncommon for a subject to have known one of these words before. If a subject knew a word previously, that word was discarded and his score reduced by one.

The subjects were run in two groups for the twelve consecutive lists which took approximately three hours. Short breaks were given between each set of four lists. All of the male and female subjects, was well as high and low imaging subjects, were run separately for the instructor-prepared image condition. Similarly all of the subjects for the student-generated images were run together at one time. Only one sequence of lists was used.

Results

Separate analyses of variance were computed for the effects of sex, image preparation source and imaging ability on the criterion of the number of words correctly learned per list. Analyses of variance were also run over blocks of four lists, because this averaged out the effect of minor differences among the individual lists of words. Refer to Table 1, 2, 3 and 4 which present the results consequently for the analayses of variance by blocks of four lists (lists one-four, five-eight, and nine-twelve) as well as for all twelve lists combined.

The effect of imaging ability was significant ($p < .05$) for List number 12 and since it was not significant in any of the combined criteria nor in any of the other 11 lists, this was felt to be a Type 1 error or chance. However, it is true that in general the high imagers did have a slightly higher score than did the low imagers.

The effect of self-prepared images or images prepared by the instructor was not significant for the first block of four lists, but it was significant (p .05) for the second and third blocks as well as overall. There was a slight differential effect; the people's scores using the instructor-prepared images declined slightly over the twelve lists whereas the people using their own images increased slightly to produce the significant differences.

The effect of sex of subject was also significant ($p < .05$) for the second and third blocks and approached significance for all twelve lists combined ($p = .053$). Females increased slightly in their ability in learning the words over the three blocks, whereas the male subjects decreased slightly in their number of words learned. This result agrees with the general finding that females are slightly better in learning words.

Table 1. ANOV summary for the effects of sex of subject, imaging ability and source of image preparation on number of words learned for block I, lists 1-4.

Source	S.S.	d.f.	F
S, Sex of subject	264.50	1	1.82
I, Imaging ability	210.13	1	1.45
P, Preparation of images	242.00	1	1.67
S × I	50.00	1	0.34
S × P	3.13	1	0.02
I × P	2.00	1	0.01
S × I × P	190.13	1	1.31
Residual	3486.00	24	—
Total	4447.88	31	—

Selected effect by levels	Treatment averages	
Sex of subject:	Male = 31.6	Female = 37.3
Image preparation	Instructor = 31.7	Self = 37.2

Table 2. ANOV summary for the effects of sex of subject, imaging ability and source of image preparation on number of words learned for block II, lists 5-8.

Source	S.S.	d.f.	F
S, Sex of Subject	790.03	1	4.92*
I, Imaging ability	247.53	1	1.54
P, Preparation of images	850.78	1	5.30*
S × I	166.53	1	1.04
S × P	16.53	1	0.10
I × P	16.53	1	0.10
S × I × P	442.53	1	2.76
Residual	3853.25	24	—
Total	6383.72	31	—

*$p < .05$

Significant effects by levels	Treatment averages	
Sex of subjects:	Male = 28.4	Female = 38.4
Image preparation:	Instructor = 28.3	Self = 38.6

Table 3. ANOV summary for the effects of sex of subject, imaging ability and source of image preparation on number of words learned for block III, lists 9-12.

Source	S.S.	d.f.	F
S, Sex of subject	569.53	1	4.81*
I, Imaging ability	101.53	1	0.86
P, Preparation of images	621.28	1	5.24*
S × I	38.28	1	0.32
S × P	0.78	1	0.01
I × P	81.28	1	0.69
S × I × P	603.78	1	5.10*
Residual	2843.75	24	—
Total	4860.22	31	—

*$p < .05$

Significant effects by levels	Treatment means	
Sex of subject:	Male = 29.6	Female = 38.1
Image preparation:	Instructor = 29.4	Self = 38.3
S × I × P: see Fig. 1		

Table 4: ANOV summary for the effects of sex of subject, imaging ability and source of image preparation on number of words learned for all 12 lists combined.

Source	S.S.	d.f.	F
S, Sex of subject	4656.13	1	4.03*
I, Imaging ability	1624.50	1	1.41
P, Preparation of Images	4851.13	1	4.20*
S × I	684.50	1	0.59
S × P	10.13	1	0.01
I × P	40.50	1	0.04
S × I × P	3528.00	1	3.05
Residual	27728.00	24	—
Total	43122.88	31	—

*$p = .053$

*$p < .05$

Significant effects by levels	Treatment averages	
Sex of subject:	Male = 29.9	Female = 37.9
Image preparation:	Instructor = 29.8	Self = 38.0

One significant ($p < .05$) interaction between all three independent variables occured with list nine and for the combined data for block three, lists 9-12. These data are presented in Figure 1. The use of instructor-prepared images hindered male subjects of low imaging ability, whereas it had no effect on those of high imaging ability. A different picture emerged for females: image source had no effect on female subjects of low imaging ability. However, self-prepared images helped high ability females, while instructor-prepared imaged hindered these women as compared with low ability females. The interpretation of this is a little puzzling and perhaps is chance. Certainly this needs replication as it showed up only on the last four lists learned (9-12).

Discussion

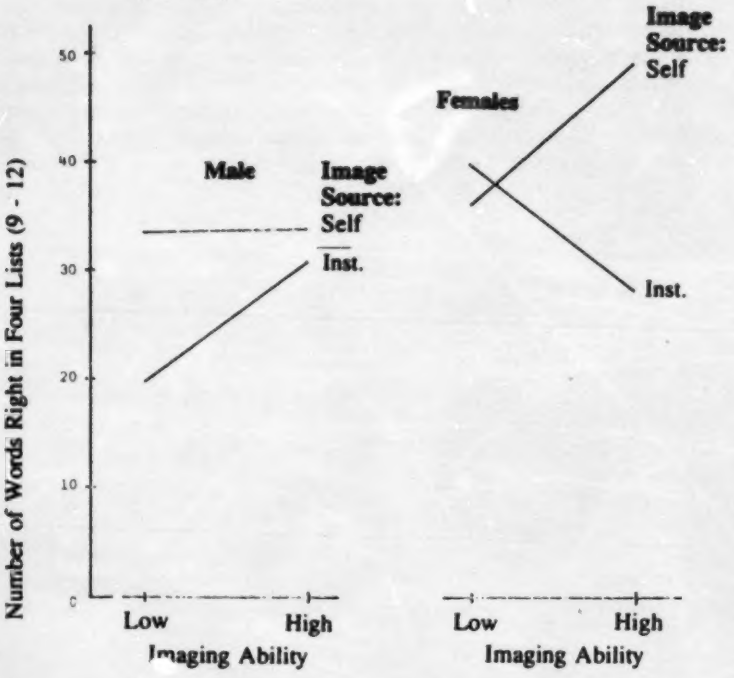
Initially the use of instructor-prepared images was only slightly and insignificantly better for the first list of 12 words learned. The use of self-prepared images for the last two blocks of images of words learned, lists 5 through 12 as well was significantly better overall. Interpretation is that images as suggested and prepared by the instructor may help students learn better initially, but that the instructor may help students learn better initially, but that the instructor then should instruct the student in how to generate his own images. After this first initial step, the use of self-generated images is superior at a practical level in providing for 29% more efficient learning overall.

The effect of sex of subject likewise took a little time to develop. But after the first four lists, female subjects were significantly superior in learning the last eight lists as compared with male subjects. Practically female subjects showed 27% superior learning to the male subjects.

The effect of imaging ability of the subjects was insignificant on all 12 lists except the last. In spite of the general lack of significance of the imaging ability variable, high imagers in general showed a slightly superior ability to learn the lists as compared with the low imaging ability subjects, a 15% difference.

There was one significant triple interacion between the three independent variables, but the interpretation of this is obscure and possibly due to chance as it occured only in last block of four lists.

Fig. 1. The effects of image preparation source, imaging ability and sex of subject on the number of rare English words learned (N = 32)



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Short Report

"Suggestive-Accelerative Learning and Teaching: An Experiment with Elements of an Altered States Approach in Reading."

Dean Held

University of Wisconsin — Superior

The purpose of this article is to discuss, briefly, the suggestive-accelerative approach to teaching.

Basically, this approach makes use of certain techniques to place a person into a hypersuggestive frame of mind. Once this is achieved, a student's learning inhibitions are diminished by making positive suggestions regarding his or her learning abilities. This, in turn, activates reserve brain power and speeds up learning and improves memory. This process is now well documented in studies from around the world. Schuster, Bordon and Gritton (1976), Bancroft (1976), Prichard (1976) and Lozanov (1971). There are certain basic techniques, according to Lozanov (1971), that certain basic techniques, according to Lozanov (1971), that can assist educators in achieving hypersuggestibility, maintain it over time and use it to the students' benefit in the learning situation. Appendix A provides a schematic interpretation of the important elements of this approach. Certain primary concerns appear to lie almost totally in the teacher's lap.

The teacher must be prestigious in nature. Lozanov believes that students learn more from people they hold in esteem. His research seems to support this (1975).

Teachers must be concerned with not only their verbal, but nonverbal behavior in the classroom setting. Students easily perceive the instructor's feelings about what is being taught, about his expectations of his students and about himself. Lozanov (1975) calls this double planeness because he considers the unconscious information stream as important as the conscious one.

Intonation and rhythm are important elements in this approach and the terms can be taken literally here. Material being presented is given in various voice tones and with precise rhythm often orchestrated with background music. This facilitates a creative approach and according to Bordon and Schuster (1976) and others enhances learning.

Through physical relaxation, mind calming and the above mentioned components a student becomes hypersuggestible and is put into an "open state" which is enlikened to the intuitive stage of a child that Piaget speaks about. Thus, proper conditions are created in a learning situation and must be maintained throughout.

Techniques that follow are used to maintain the created conditions and facilitate learning over extended periods.

Since Lozanov uses and experiments with the approach holistically, it is difficult to determine what facilitates what. Nevertheless, certain procedures appear to be used to maintain the created conditions over time.

Method

This research used only two of the components mentioned above, namely: Mind calming and Early Pleasant Learning Recall.

Sixty-four fifth and sixth grade students using stratified random assignments were placed into a no treatment group and three treatment groups as follows: Mind calming, Early Pleasant Learning Recall (E.P.L.R.) and a combination of the aforementioned.

Twelve randomly assigned rare English words were taught during each of two sessions. Each group and each session used a different set of rare words which were taught by the following procedure.

Preparation (treatment)

Students in one group received five minutes of mind calming (a focus on breathing exercise) prior to the word lesson. Another group received E.P.L.R. instructions five minutes prior to the word lesson. A third group used a combination of the mind calming and E.P.L.R. for five minutes, while the fourth had no treatment prior to the word lesson.

Active phase

New words were presented on flash cards. The subjects saw the words, heard them pronounced, received the common synonym and listened to each word used in context. This was repeated twice for each word over a period of exactly fifteen minutes for each group.

Passive session

During this session the subjects relaxed and listened to the new words, synonyms and sentences being repeated twice. This was an auditory presentation only. This phase was of ten minutes duration for each group.

Testing and analysis

Students were tested using the same flash cards as used in the teaching session. They were given a visual and an auditory stimulus and asked to define the word or use it correctly in a sentence. A second party was used to make final judgment as to the accuracy of word usage.

Analysis of variance was used along with the Newman-Keuls post-hoc test. The independent variables were the three treatments along with the sex, grade level (fifth or sixth) and reading level (upper or lower) of the 64 subjects. The dependent variables or criterion were acquistion tests for each of the two sessions and delayed recall tests for each of the two sessions.

Results and Discussion

The data produced by this study were analyzed through analysis of variance. There were two immediate retention sessions and two long range retention sessions. Hence, four analyses were run. The .05 significance level was used as an indication of a real difference in all cases.

In acquisition—session one there were no significant main or interaction effects. In acquisition—session two, however, a significant difference attributable to reading level emerged ($P < .01$). Again, there were no significant interactions.

In delayed recall—session one, three significant differences occurred. They were in reading level (P< .01), grade (P< .05) and treatment (P< .05). The higher reading level and grade level prevailed. *Since four treatments were employed, a Newman-Keuls test was applied to the data.*

This post-hoc analysis compares each *mean to the others and determined which were significantly different.*

E.P.L.R. and Zen were significantly superior to no treatment and the combination (P< .05).

A significant Reading by Treatment by Grade interaction was also found in delayed recall—session one (P< .05). Here, E.P.L.R. produced higher scores with high reading level fifth graders, and low reading level sixth graders. Zen was associated with higher scores in the case of high reading level sixth graders. No treatment produced lower scores with fifth graders of low reading level.

In delayed recall—session two, a significant difference attributable to reading level occured (P< .01). As in session one, a significant Reading by Treatment by Grade interaction appeared (P< .05). E.P.L.R. was associated with higher scores by high reading level fifth graders. No treatment was associated with lower scores by high reading level sixth graders and low reading level fifth graders. No substantial score differences were found among low reading level sixth graders.

In summation, student reading level *appeared to be the most influential factor in this series of experiments. This factor was* significant in three of the four analyses *and approached significance in the fourth. Treatment appeared as a meaningful factor in only one of the four sessions; long range retention—session one. Here, Zen and E.P.L.R. were superior to no treatment and the combination. The Reading by Grade by Treatment interactions may be worth additional study. It is posible that certain treatments will be more productive in specific situations. On the other hand, the interactions may have occurred because of the small number of subjects involved in the investigation and thus were due to chance alone. In either case, an investigation concerning a larger number of subjects would provide an adequate response to this question.*

Reading level appeared to be the most influential factor in this study since, in three out of the four criterion, reading level gained significance. Spache and Spache (1973), Bond and Tinker (1967) and others support this finding. Better readers would be expected to learn new vocabulary with greater ease than poorer readers. Better readers generally have better word attack skills and a more highly developed visual memory and a richer background of experience.

Grade level reached significance only once and that was in delayed recall. Since word difficulty was carefully controlled for all sessions it would appear that word difficulty level was not a confounding factor in that session. The fact that sixth graders were superior over fifth graders

in only one word test is difficult to explain. Perhaps this happened by chance, or possibly it was due to the small number of subjects involved in the study. It is not too surprising, however, that the main effects of grade level were not highly significant throughout the study since the spread of reading abilities is so wide in those grades and not too dissimilar (Bond and Tinker, 1967). A study by Balevski and Ganovski (4) show little difference between children of ages eleven and twelve in the effects of suggestion on short term or long term memory.

Sex differences did not reach significance in any of the dependent criterion. Again, this is not too surprising since Lozanov (1971) originally claimed no sex differences in the effectiveness of this approach. More recent studies, however, do claim a slight edge for women in reproducing words learned (Balevski and Ganovski, 1975b). There are few studies available on this topic at these two grade levels. Maccoby and Jacklin (1976), in their research failed to find sex differences in elementary age children in suggestibility, ability to inhibit early incorrect learning, auditory and visual activities or rote learning. A study by Balevski and Ganovski (1975a) show slight differences in favor of girls for the effects of suggestion on short term memory.

The main effects of treatment reached significance only once and that was in delayed recall. Here E.P.L.R. and mind calming were significant over the combination and no treatment. These transient results are difficult to understand since other researchers support their use (Schuster, 1976; Benitez-Bordon and Schuster, 1976). Perhaps treatment exercises were not of proper duration and a longitudinal study is needed to test these treatment effects over time. Since this study was brief and had small numbers of subjects the results could have happened by chance. E.P.L.R. was, by itself, more consistently helpful since all lower readers benefited from it in both delayed recall tests.

In spite of some beneficial results in the use of E.P.L.R. and mind calming, the combination of the two did not reach significance in the dependent variable in any session. Since the two treatments were beneficial in isolation one would expect compounding results. Again it is suggested that time was a contributing factor here. Longer treatment periods are probably needed. The time allowed for the combination was the same as for either treatment by itself, namely five minutes.

The only significant interactions in relation to treatments, grade, sex and reading level that emerged was a Reading by Grade by Treatment interaction. Since this interaction appeared twice, and both in delayed recall, it appears to be worthy of further study. More research will be needed to try to determine why there was significant interaction in delayed recall and not in immediate recall.

The results of this study were both encouraging and discouraging because of their transient nature. Nevertheless, further research is warranted to answer questions this study provoked.

Implications for further research.

a) Research to determine which particular treatment is most beneficial in relation to grade and reading levels.

b) Research to determine the effects of these treatments over time.

c) Research to determine how to best operationalize these treatments in the elementary classroom.

d) Research to determine the value of these treatments, and others, for both remedial and accelerated students.

e) Research to study the effect of suggestion on children at various ages.

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